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GYPSUM FORUM

A CIRCULAR ECONOMY FOR THE CONSTRUCTION SECTOR:
The Gypsum Example
Views of Stakeholders

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Economic, Environmental and Societal Evaluation of the Value Chain (Deconstruction-Recycling-Reincorporation)

17 November 2015, Brussels, European Parliament

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GtoG pilot projects

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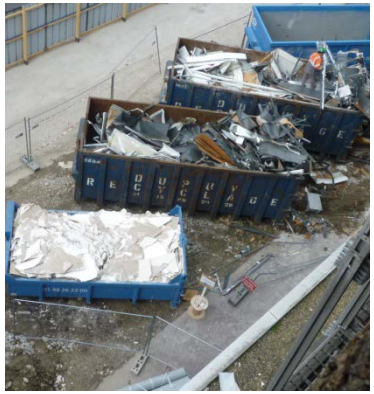
KPIs are developed and applied in the pilot projects:






The UK Germany France (2) Belgium

After data collection and analysis **29 Best Practice Indicators (BPIs)**, aiming to recognize and encourage best practices in the deconstruction, recycling and reincorporation process are selected.

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Indicators – Spreadsheet template

(Deco/Rec/Reinco) - Tech/Env/Soc/Eco - CODE

Area of influence

Code. Name of the indicator

- Technical
- Environmental
- Social
- Economic

Description

Explanation of what the indicator is measuring*.

Evaluation method

Criteria used to assess the results obtained, per sub-indicator.

	Code. Name of the sub-indicator (unit)	Code. Name of the sub-indicator (unit)
Parameters	Parameter 1 - Factor (unit)	Parameter 4 - Factor (unit)
	Parameter 2 - Factor (unit)	Parameter 5 - Factor (unit)
	Parameter 3 - Factor (unit)	
Equation	Parameters combined in an equation	$\text{CODE} = \frac{factor_4 + factor_5}{factor_4}$
	PARCIAL RESULT	PARCIAL RESULT
	GLOBAL RESULT	

* Footnote when further clarification is required

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KPIs index

Deconstruction - Performance Indicators		
Criteria	**Stage**	**Indicator**
TECH	Audit Deconstruction Traceability	TECH1. Existence and deviation of the audit for gypsum-based systems TECH2. Effectiveness of the deconstruction process TECH3. Effectiveness of the traceability
ENV	End route	ENV1. Gypsum waste sent to landfill ENV2. Transport emissions comparison between recycling and landfilling
SOC	Decon - Demol Deconstruction	SOC1. Labour time difference between dismantling and demolishing SOC2. Productivity SOC3. Training of the deconstruction team SOC4. Follow-up of the waste management
ECO	Audit Deconstruction Traceability	ECO1. Audit cost ECO2. Plasterboard dismantling and loading cost ECO3. Gypsum block dismantling and loading cost ECO4. Cost difference between recycling GW and landfilling route

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Recycling - Performance Indicators

Criteria	Stage	Indicator
TECH	Reception	TECH1. Quality of the gypsum waste received
		TECH2. Gypsum waste rejected
	Storage	TECH3. Warehouse storage capacity for gypsum waste
	Processing	TECH4. Output materials of the recycling process
ENV	Processing and transport	ENV1. CO_2 emissions from the recycling process
		ENV2. Natural gypsum saved
SOC	Reception	SOC1. Recycler's satisfaction
ECO	Processing	ECO1. Energy cost of the gypsum waste processing
	Transport	ECO2. Transport cost of the recycled gypsum

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Reincorporation - Performance indicators

Criteria	Stage	Indicator
TECH	Reception	TECH1. Recycled gypsum rejected by the manufacturer
		TECH2. Recycled gypsum quality criteria
	Storage	TECH3. Warehouse storage capacity for recycled gypsum
	Reincorporation	TECH4. Recycled gypsum content
		TECH5. Recycled content increase
	Manufacturing	TECH6. Production waste
ENV	Preprocessing	ENV1. CO_2 emissions: business-as-usual compared to maximized recycled content in the preprocessing
	Manufacturing	ENV2. CO_2 emissions: business-as-usual compared to maximized recycled content in the production process
SOC	Manufacturing	SOC1. Manufacturer's satisfaction
ECO	Reception	ECO1. Cost difference between business-as-usual and maximized recycled content quality check
		ECO2. Cost difference between natural gypsum and recycled gypsum
		ECO3. Cost difference between FGD gypsum and recycled gypsum
	Preprocessing	ECO4. Energy cost difference between business-as-usual and maximized recycled content in the preprocessing
	Manufacturing	ECO5. Energy cost difference between business-as-usual and maximized recycled content in the production process

Monitoring of GtoG pilot projects: summary of results

	DECONSTRUCTION							
	Audit	Deconstruct.		Traceability			End route	
	TECH1	TECH2	SOC3	SOC4	TECH3	ECO4	ENV1	ENV2
R1								
R2								
R3								
R4								
R5								-

	RECYCLING						
	Reception		Stor.	Recep	Process. & transp.		
	TECH1	TECH2	TECH3	SOC1	TECH4	ENV1	ENV2
R1						-	
R2						-	
R3						-	
R4						-	
R5						-	

	REINCORPORATION												
	Reception					Stor.	Preprocess.		Reincorp.		Manufacturing		
	TECH1	TECH2	ECO1	ECO2	ECO3	TECH3	ENV1	ECO4	TECH4	TECH5	TECH6	ENV2	SOC1	ECO5
R1				n/a			-	-						
R2			-	-	-		-	-						-
R3			-		n/a		-	-						
R4					n/a		-	-						
R5				n/a	n/a		-	-						

Main challenges:

- Implementation of a pre-deconstruction audit of materials.
- Data collection for the calculation of CO_2 emissions from the recycling and pre-processing stage.
  - Compliance with a common quality criteria, specified in the report “Protocol of action B2.2: Quality criteria for recycled gypsum, technical and toxicological parameters”.

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Conclusions

- To **assess the sustainable performance of the gypsum value chain** the different stages and processes should be considered.
- The defined analytical framework can be used as a **decision-making tool** helping to increase the effectiveness of the gypsum recycling route, measuring the performance and progress of gypsum waste management, detecting possibilities of improvement as well as monitoring changes over time.

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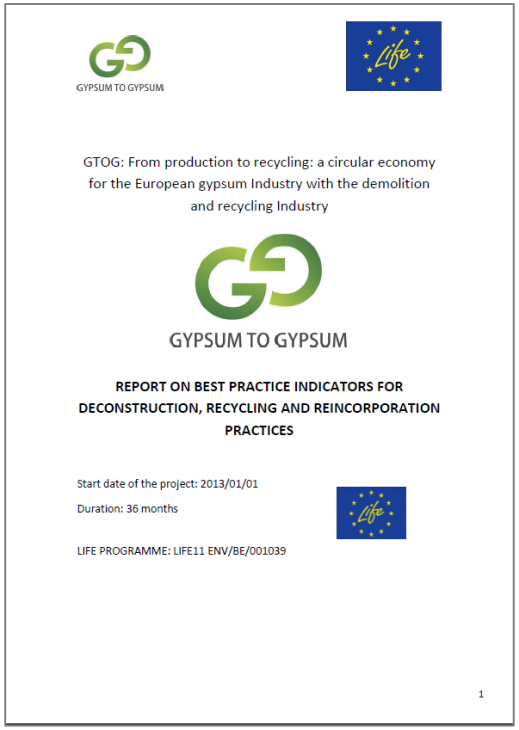
Report on best practice indicators for deconstruction, recycling and reincorporation practices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GTOG: From production to recycling: a circular economy for the European gypsum Industry with the demolition and recycling Industry

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REPORT ON BEST PRACTICE INDICATORS FOR DECONSTRUCTION, RECYCLING AND REINCORPORATION PRACTICES

Start date of the project: 2013/01/01

Duration: 36 months

LIFE PROGRAMME: LIFE11 ENV/BE/001039

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GtoG Project

From production to recycling: a circular economy for the European gypsum Industry with the demolition and recycling Industry

LIFE PROGRAMME
LIFE11 ENV/BE/001039

DC1 Report of Best Practice Indicators for deconstruction, recycling and reincorporation practices

EXECUTIVE SUMMARY

JULY 2015

All GtoG reports produced are available on the GtoG website www.gypsumtogypsum.org

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